



Sheet 1 of 18

Application No.: 08/846,658
Title: Humanised Antibodies
Inventors: John R. Adair, Diljeet S. Athwal and John S. Emrige
Docket No. CARP-0057
Atty: Doreen Yatko Trujillo
Date of Filing: May 1, 1997
Telephone No. (215) 568-3100

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TECH CENTER 1600/2900

1 GAATTCCCAA AGACAAAatg gatttcaag tgcatgattt cagttccgt
51 ctaatcagt cctcagtcat aatatccaga ggacaaattg ttctcaccca
101 gtctccagca atcatgtctg catctccagg ggagaaggtc accatgacct
151 gcagtgcag ctcaagtgt aattacatga actggatcca gcagaagtca
201 ggcacacctcc ccaaaagatg gatttatgac acatccaaac tggcttctgg
251 agtccctgtct cacttcaggg gcagtgggtc tgggacactt tactctctca
301 caatcagcgg catggaggct gaagatgctg ccacttatta ctgccagcag
351 tggagtagta accattcac gttcggtcg gggacaaaagt tggaaataaa
401 ccgggctgtat actgcaccaa ctgtatccat cttccacca tccagtgagc
451 agttAACATC tggaggtgcc tcagtcgtgt gcttcttgaa caacttctac
501 cccaaagaca tcaatgtcaa gtggaaagatt gatggcagtgc aacgacaaaa
551 tggcgtcctg aacagttgga ctgatcagga cagcaaagac agcacctaca
601 gcatgagcag caccctcagc ttgaccaagg acgagtatga acgacataac
651 agctataacct gtgaggccac tcacaagaca tcaacttcac ccattgtcaa
701 gagcttcaac aggaatgagt gtTAGAGACA AAGGTCCTGA GACGCCACCA
751 CCAGCTCCCCA GCTCCATCCT ATCTTCCCTT CTAAGGTCTT GGAGGCTTCC
801 CCACAAGCGC tTACCACTGT TGCGGTGCTC TAAACCTCCT CCCACCTCCT
851 TCTCCTCCTC CTCCCTTTCC TTGGCTTTA TCATGCTAAT ATTTGCAGAA
901 AATATTCAAT AAAGTGAGTC TTTGCCTTGA AAAAAAAA AAA
(SEQ ID NO:4)

FIG. 1a

1 MDFQVQIFSF LLISASVIIS RGQIVLTQSP AIMASPGEK VTMTCSASSS
51 VSYMNWYQQK SGTSPKRWIY DTSKLASGVP AHFRGSGSGT SYSLTISGME
101 AEDAATYYCQ QWSSNPFTFG SGTKLEINRA DTAPTVSIFP PSSEQLTSGG
151 ASVVCFLNNF YPKDINVWKW IDGSERQNGV LNSWTDQDSK DSTYSMSSTL
201 TLTKDEYERH NSYTCEATHK TSTSPIVKSF NRNEC* (SEQ ID NO:5)

FIG. 1b

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1 GAATTCCCCT CTCCACAGAC ACTGAAAACT CTGACTCAAC ATGGAAAGGC
 51 ACTGGATCTT TCTACTCCTG TTGTCAAGTAA CTGCAGGTGT CCACTCCCAG
 101 GTCCAGCTGC AGCAGTCTGG GGCTGAAC TG GCAAGACCTG GGGCCTCAGT
 151 GAAGATGTCC TGCAAGGCTT CTGGCTACAC CTTTACTAGG TACACGATGC
 201 ACTGGGTAAA ACAGAGGCCT GGACAGGGTC TGGAATGGAT TGGATACATT
 251 ATTCCCTAGCC GTGGTTATAAC TAATTACAAT CAGAAGTTCA AGGACAAGGC
 301 CACATTGACT ACAGACAAAT CCTCCAGCAC AGCCTACATG CAACTGAGCA
 351 GCCTGACATC TGAGGGACTCT GCAGTCTATT ACTGTGCAAG ATATTATGAT
 401 GATCATTACT GCCTTGACTA CTGGGGCCAA GGCACCACTC TCACAGTCTC
 451 CTCAGCCAAA ACAACAGCCC CATCGGTCTA TCCACTGGCC CCTGTGTGTG
 501 GAGATACAAC TGGCTCCTCG GTGACTCTAG GATGCCTGGT CAAGGGTTAT
 551 TTCCCTGAGC CAGTGACCTT GACCTGGAAC TCTGGATCCC TGTCCAGTGG
 601 TGTGCACACC TTCCCAGCTG TCCTGCAGTC TGACCTCTAC ACCCTCAGCA
 651 GCTCAGTGAC TGTAACCTCG AGCACCTGGC CCAGCCAGTC CATCACCTGC
 701 AATGTGGCCC ACCCGGCAAG CAGCACCAAG GTGGACAAGA AAATTGAGCC
 801 ACCTCTTGGG TGGACCATCC GTCTTCATCT TCCCTCCAAA GATCAAGGAT
 851 GTACTCATGA TCTCCCTGAG CCCCATAGTC ACATGTGTGG TGGTGGATGT
 901 GAGCGAGGAT GACCCAGATG TCCAGATCAG CTGGTTTGTG AACAAACGTGG
 951 AAGTACACAC AGCTCAGACA CAAACCCATA GAGAGGATTA CAACAGTACT
 1001 CTCCGGGTGG TCAGTGCCCT CCCCCATCCAG CACCAAGACT GGATGAGTGG
 1051 CAAGGAGTTC AAATGCAAGG TCAACAAACAA AGACCTCCCA GCGCCCATCG
 1101 AGAGAACCAT CTCAAAACCC AAAGGGTCAG TAAGAGCTCC ACAGGTATAT
 1151 GTCTTGCTC CACCAAGAAGA AGAGATGACT AAGAAACAGG TCACTCTGAC
 1201 CTGCATGGTC ACAGACTTCA TGCCTGAAGA CATTACGTG GAGTGGACCA
 1251 ACAACGGGAA AACAGAGCTA AACTACAAGA ACACGTGAAAC AGTCCCTGGAC
 1301 TCTGATGGTT CTTACTTCAT GTACAGCAAG CTGAGAGTGG AAAAGAAGAA
 1351 CTGGGTGGAA AGAAAATAGCT ACTCCTGTTC AGTGGTCCAC GAGGGTCTGC
 1401 ACAATCACCA CACGACTAAG AGCTTCTCCC GGACTCCGGG TAAATGAGCT
 1451 CAGCACCCAC AAAACTCTCA GGTCCAAAGA GAGACCCACA CTCATCTCCA
 1501 TGCTTCCCTT GTATAAATAA AGCACCCAGC AATGCCTGGG ACCATGTAAA
 1551 AAAAAAAAAAA AAAGGAATT (SEQ ID NO:6)

FIG. 2a

Application No.: 08/846,658

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OKT 3 HEAVY CHAIN PROTEIN SEQUENCE DEDUCED FROM DNA SEQUENCE

1 MERHWIFLLL LSVTAGVHSQ VQLQQSGAEL ARPGASVKMS CKASGYTFTR
51 YTMHWVKQRP GQGLEWIGYI NPSRGYTNYN QKFKDKATLT TDKSSSTAYM
101 QLSSLTSEDS AVYYCARYYD DHYCLDYWGQ GTTLTVSSAK TTAPSVYPLA
151 PVCGDTTGSS VTLGCLVKGY FPEPVTLWN SGSLSSGVHT FPAVLQSDLY
201 TLSSSVTVTS STWPSQSITC NVAHPASSTK VDKKIEPRGP TIKPCPPCKC
251 PAPNLLGGPS VFIFPPKIKD VLMISLSPIV TCVVVVDVSED DPDVQISWFV
301 NNVEVHTAQI QTHREDYNST LRVVSALPIQ HQDWMSGKEF KCKVNNKDLP
351 APIERTISKP KGSRVRAPQVY VLPPPEEEMT KKQVTLTCMV TDFMPEDIYV
401 EWTNNNGKTEL NYKNTEPVLD SDGSYFMYSK LRVEKKNWVE RNSYSCSVVH
451 EGLHNHHHTTK SFSRTPGK* (SEQ ID NO: 7)

FIG. 2b

Application No.: 08/846,658

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	1	23	42
RES TYPE	NN N	N	N N
Dkt3vl	SBspSPESSsBSbSsSssPSPSPsPSsse*s*p*p^ISsSe		
REI	QIVLTQSPA IMSASPGEKVTMTCASS. SVSYMNWYQQKSGT		
	DIQMTQSPSSLASAVGDRV T TCQASQDI I KYLNWYQQ I PGK		
	?		
	CDR1 (LOOP)	*****	
	CDR1 (KABAT)	*****	
		56	85
RES TYPE	N NN		
Dkt3vl	*Is;PpIeesesssSBEsePsPSBSEsPspsPsseesSPePb		
REI	SPKRWIYDT SKLASGVPAHFRGSGSGTSYSLTISG MEAEDAAT		
ID NO:8)	APKLLIYEASNLQAGVPSRFSGSGSGTD YTET TISSLQPED I AT		(SEQ
	?	??	?
	*****	CDR2 (LOOP/KABAT)	
		102 108	
RES TYPE	P;PIPIies**;PII s PPSPSPSS		
Dkt3vl	YYCQQWSSNPFTFG SG TKLE I <u>N</u> R (SEQ ID NO:29)		
REI	YYCQQYQSLPYTF G QGT KL <u>Q</u> I R (SEQ ID NO:9)		
	?	?	
	*****	CDR3 (LOOP)	
	*****	CRD3(KABAT)	

FIG. 3

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	NN N	23 26	32 35	N39	43	
RES TYPE	SESPs^SBssS^sSSsSpSpSPsPSEbSBssBePi^PIpiesss					
DKt3h	QVQLQQ <u>S</u> GAE <u>L</u> ARP <u>G</u> ASVK <u>M</u> SCKASGYTFTRYTMNHWVKQRPGQ					
KOL	<u>Q</u> VQLVE <u>S</u> GGG <u>V</u> QP <u>G</u> RSLRL <u>S</u> <u>C</u> <u>S</u> <u>S</u> GF <u>I</u> FSSYAMYWVRQAPGK					
	?	??				
		*****	CDR1 (LOOP)			
		*****	CDR1 (KABAT)			
	52a 60 65 N N N 82abc 89					
RES TYPE	IIeIppp^ssssssss^ps^pSSsbSpseSsSseSp^pSpS B ssS^ePb					
DKt3vh	GLEWIGYINPSRGYTNTNQKF <u>K</u> R <u>K</u> ATLTTDKSSSTAYMQLSSLTSEDSAV					
KOL	GLEWVA <u>I</u> IWDDGSDQHYADSVKG <u>RFTI</u> SRDN <u>S</u> KN <u>T</u> LE <u>L</u> QMDSL <u>P</u> PEDT <u>G</u> V					
	??	?? ? ? ?				
		*****	CDR2 (LOOP)			
		*****	CDR2 (KABAT)			
	92 N	107	113			
RES TYPE	P <i>i</i> PIE <i>s</i> ss <i>s</i> i <i>i</i> ss <i>b</i> ib <i>i</i> *EIP <i>I</i> P*i <i>s</i> pSBSS					
DKt3vh	YYCARYYDDHY.....CLDYWGQGTTLVSS (SEQ ID NO:30)					
KOL	YE <u>CARDGGHGFCSSASCFGPDYWGQGTPVTVSS</u> (SEQ ID NO:10)					
	*****	CRD4 (KABAT/LOOP)				

FIG. 4

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OKT 3 HEAVY CHAIN CDR GRAFTS

1. gh341 and derivatives

	1	26	35	39	43	
OKt3vh	QVQLQQSGAELARPGASVKMSCKASGYTFTRYTMHWVKQRPGQ					
gH341	QVQLVESGGGVVQGRSLRLSCSSSGYTFTRYTMHWVRQAPGK					JA178
gH341A	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>K</u> ASGYTFTRYTMHWVRQAPGK					JA185
gH341E	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>K</u> ASGYTFTRYTMHWVRQAPGK					JA198
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>K</u> ASGYTFTRYTMHWVRQAPGK					JA207
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>K</u> ASGYTFTRYTMHWVRQAPGK					JA209
gH341D	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>K</u> ASGYTFTRYTMHWVRQAPGK					JA197
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>K</u> ASGYTFTRYTMHWVRQAPGK					JA199
gH341C	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>K</u> ASGYTFTRYTMHWVRQAPGK					JA184
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSCSASGYTFTRYTMHWVRQAPGK					JA203
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>S</u> ASGYTFTRYTMHWVRQAPGK					JA205
gH341B	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>S</u> SSGYTFTRYTMHWVRQAPGK					JA183
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>S</u> ASGYTFTRYTMHWVRQAPGK					JA204
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>S</u> ASGYTFTRYTMHWVRQAPGK					JA206
gH341*	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>S</u> ASGYTFTRYTMHWVRQAPGK					JA208
KDL	QVQLV <u>Q</u> ESGGGVVQPGRSLRLSC <u>S</u> SSGFIFSSYAMYWVRQAPGK					

FIG. 5a

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	44	50	65	83	
0kt3vh	GLEWIGYINPSRGYTNYNQKFKD KATLTTDKSSSTAYMQLSSLT				
gH341	GLEWVAYINPSRGYTNYNQKF KDRTIISRDNSKNTLFLQMDSL R				JA178
gH341A	GLEW <u>I</u> GYINPSRGYTNYNQK V <u>K</u> DRFTIIS <u>T</u> D <u>K</u> SK <u>S</u> TAF LQMDSL R				JA185
gH341E	GLEWIGYINPSRGYTNYNQK V <u>K</u> DRFTIIS <u>T</u> D <u>K</u> SK <u>S</u> TAF LQMDSL R				JA198
gH341*	GLEW <u>I</u> GYINPSRGYTNYNQK V <u>K</u> DRFTIIS <u>T</u> D <u>K</u> SK <u>N</u> TAF LQMDSL R				JA207
gH341*	GLEWIGYINPSRGYTNYNQK V <u>K</u> DRFTIISRDNSKNTAFLQMDSL R				JA209
gH341D	GLEWIGYINPSRGYTNYNQK V <u>K</u> DRFTIIS <u>T</u> D <u>K</u> SKNTLFLQMDSL R				JA197
gH341*	GLEWIGYINPSRGYTNYNQK V <u>K</u> DRFTIISRDNSKNTLFLQMDSL R				JA199
gH341C	GLEWVAYINPSRGYTNYNQKF KDRTIISRDNSKNTLFLQMDSL R				JA184
gH341*	GLEWIGYINPSRGYTNYN <u>O</u> K <u>V</u> KDRFTIIS <u>T</u> D <u>K</u> SK <u>S</u> TAF LQMDSL R				JA207
gH341*	GLEWIGYINPSRGYTNYN <u>O</u> K <u>V</u> KDRFTIIS <u>T</u> D <u>K</u> SK <u>S</u> TAF LQMDSL R				JA205
gH341B	GLEWIGYINPSRGYTNYN <u>O</u> K <u>V</u> KDRFTIIS <u>T</u> D <u>K</u> SK <u>S</u> TAF LQMDSL R				JA183
gH341*	GLEWIGYINPSRGYTNYN <u>O</u> K <u>V</u> KDRFTIIS <u>T</u> D <u>K</u> SK <u>S</u> TAF LQMDSL R				JA204
gH341*	GLEWIGYINPSRGYTNYN <u>O</u> K <u>V</u> KDRFTIIS <u>T</u> D <u>K</u> SK <u>S</u> TAF LQMDSL R				JA206
gH341*	GLEWIGYINPSRGYTNYN <u>O</u> K <u>V</u> KDRFTIIS <u>T</u> D <u>K</u> SK <u>N</u> TAF LQMDSL R				JA208
KOL	GLEWVAIWDDGSDQHYADSVKG RFTIISRDNSKNTLFLQMDSL R				

FIG. 5b

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	84	95	102	113	SEQ ID NO:
0kt3vh	SEDSAVYYCARYYDDHY		CLDYWGQGTTLTVSS		
gH341	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA178 30
gH341A	PEDTA <u>VYY</u> CARYYDDHY		CLDYWGQGTTLTVSS		JA185 12
gH341E	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA198 13
gH341*	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA207 14
gH341D	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA197 15
gH341*	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA209 16
gH341*	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA199 17
gH341C	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA184 18
gH341*	PEDTA <u>VYY</u> CARYYDDHY		CLDYWGQGTTLTVSS		JA203 19
gH341*	PEDTA <u>VYY</u> CARYYDDHY		CLDYWGQGTTLTVSS		JA205 20
gH341B	PEDTA <u>VYY</u> CARYYDDHY		CLDYWGQGTTLTVSS		JA183 21
gH341*	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA204 22
gH341*	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA206 23
gH341*	PEDTGVYFCARYYDDHY		CLDYWGQGTTLTVSS		JA208 24
KOL	PEDTGVYFCARDGGHGFCSSASCFGPDYWGQGTPVTVSS				10

FIG. 5c

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OKT3 LIGHT CHAIN CDR GRAFTING

1. gL221 and derivatives

	1	24	34	42	
OKt3vl	QIVLTQSPA <u>MSASPGEKVTMTC</u> SASS.	SVSYM	NWYQQKSGT		
gL221	DIQM TQSPSSLSASVGDRV TITCSASS.	SVSYM	NWYQQTPGK		
gL221A	QIVMTQSPSSLSASVGDRV TITCSASS.	SVSYM	NWYQQTPGK		
gL221B	QIVMTQSPSSLSASVGDRV TITCSASS.	SVSYM	NWYQQTPGK		
gL221C	DIQM TQSPSSLSASVGDRV TITCSASS.	SVSYM	NWYQQTPGK		
REI	DIQM TQSPSSLSASVGDRV TITCQASQDI IKYLNWYQQTPGK				
	43	50	56		85
OKt3vl	SPKRW IYDT SKLASGVPAHFRGSGSGTSYSLTISGMEAEADA				
gL221	APKLLIY <u>DTSKL</u> ASGVPSRFSGSGSGTDYTFTISSLQPEDIAT				
gL221A	APKRW IYDT SKLASGVPSRFSGSGSGTDYTFTISSLQPEDIAT				
gL221B	APKRW IYDT SKLASGVPSRFSGSGSGTDYTFTISSLQPEDIAT				
gL221C	APKRW IYDT SKLASGVPSRFSGSGSGTDYTFTISSLQPEDIAT				
REI	APKLLIYEASNQAGVPSRFSGSGSGTDYTFTISSLQPEDIAT	(SEQ ID NO:8)			
	86	91	96	108	
OKt3vl	YYCQQWSSNPFTFGSGTKLEINR				(SEQ ID NO:29)
gL221	YYC <u>QQWSSN</u> PETFGQGTLQITR				(SEQ ID NO:25)
gL221A	YYC <u>QQWSSN</u> PETFGQGTLQITR				(SEQ ID NO:26)
gL221B	YYC <u>QQWSSN</u> PETFGQGTLQITR				(SEQ ID NO:27)
gL221C	YYC <u>QQWSSN</u> PETFGQGTLQITR				(SEQ ID NO:28)
REI	YYCQQYQSLPY <u>TFGQGTLQITR</u>				(SEQ ID NO:9)

CDR'S ARE UNDERLINED

FRAMEWORK RESIDUES INCLUDED IN THE GENE ARE DOUBLE UNDERLINED

FIG. 6

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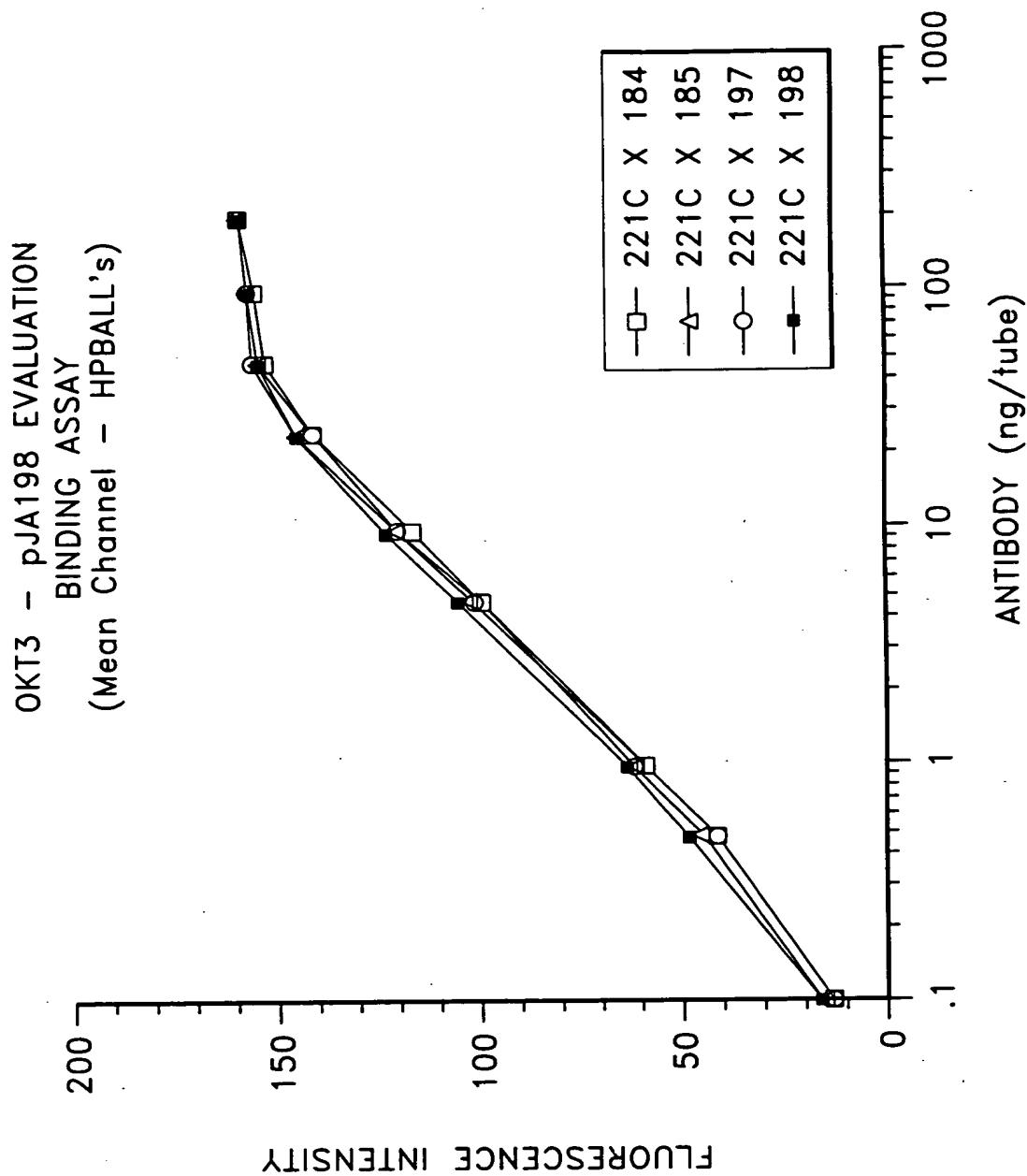


FIG. 7

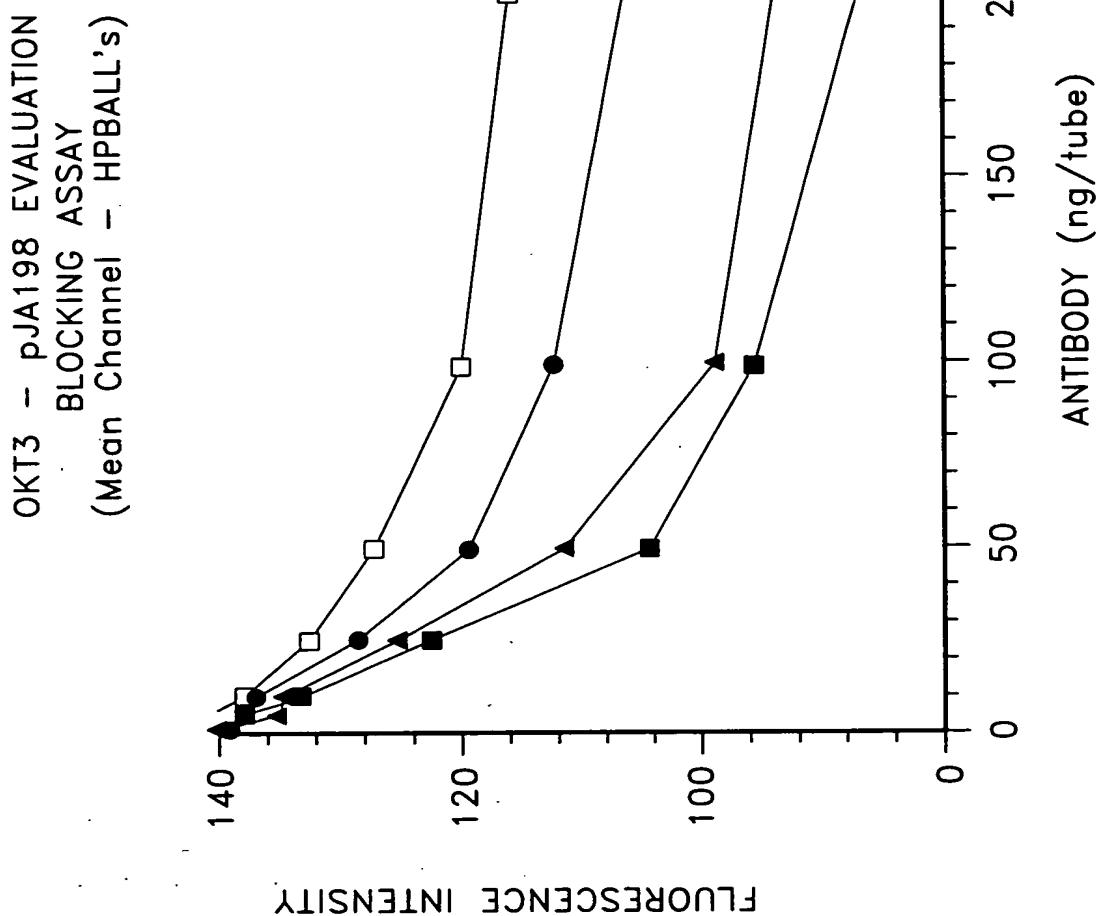


FIG. 8

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BLOCKING ASSAY
(Mean Channel - HPBALL's)

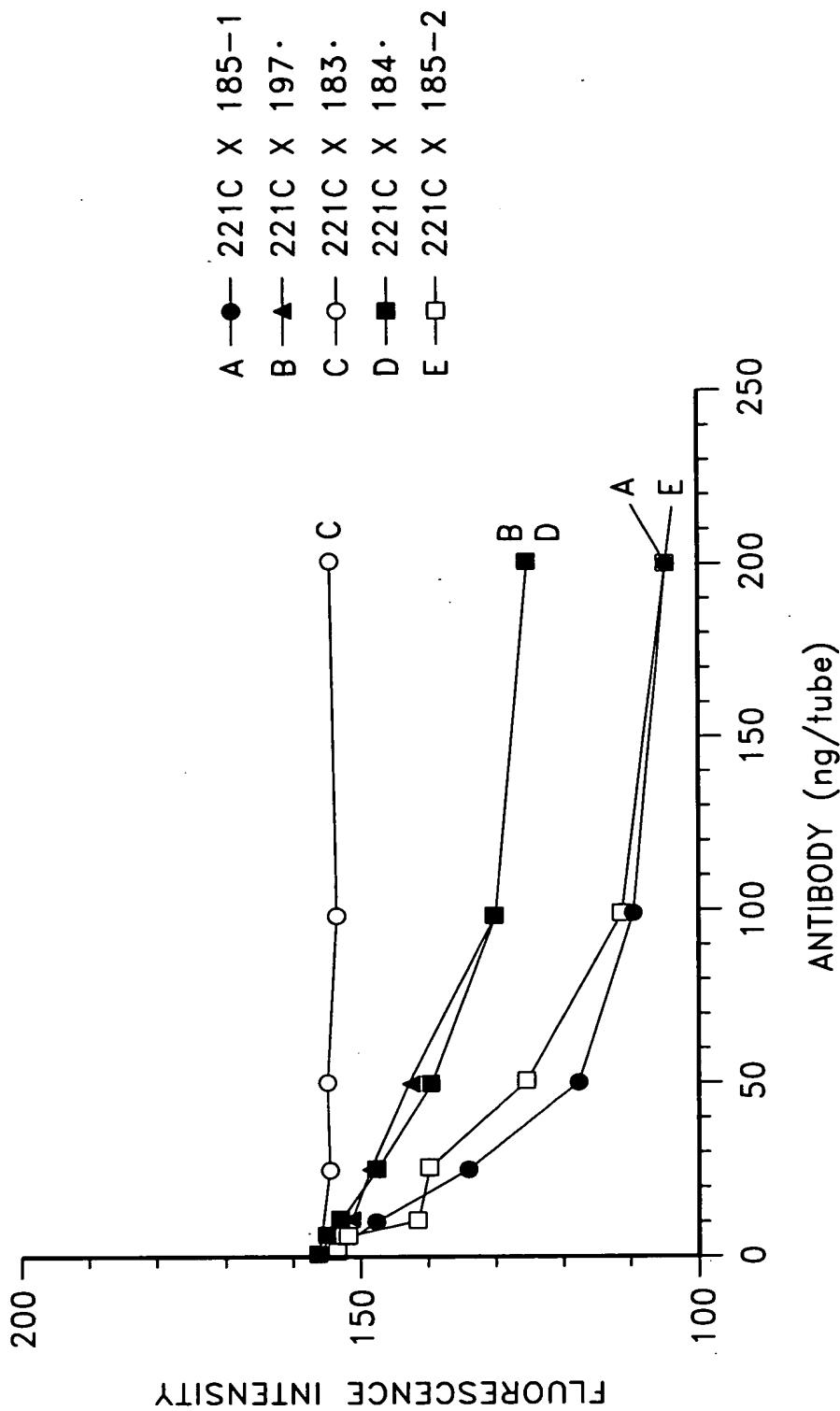


FIG. 9

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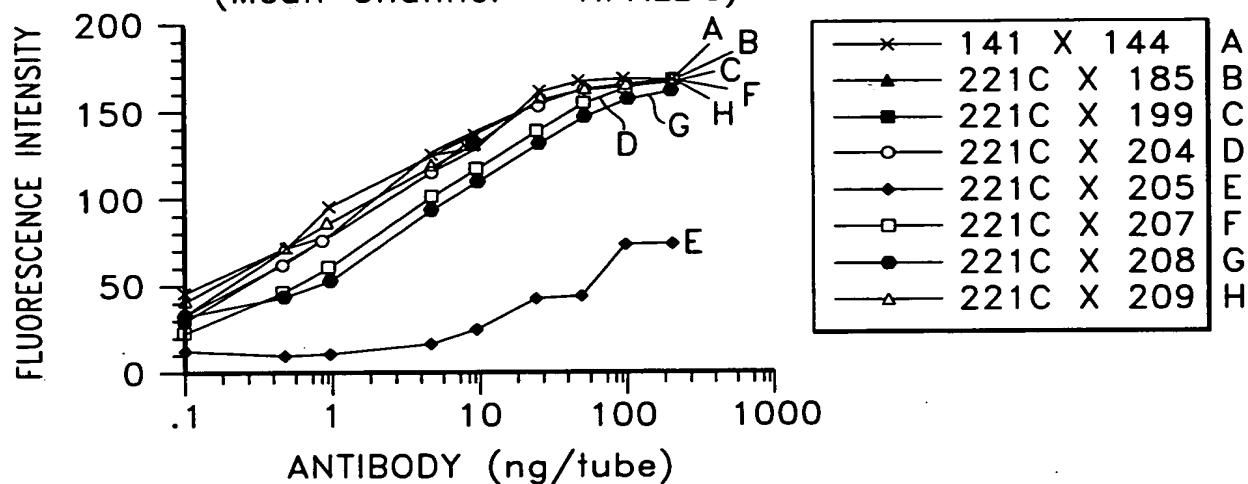
Docket No. CARP-0057

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**OKT3 - GRAFTED HEAVY CHAINS
BINDING ASSAY**
(Mean Channel - HPALL's)



● (205)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
● (208)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
○ (204)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
■ (199)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
□ (207)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
▲ (185)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
△ (209)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
* 141 X 144	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,

FIG. 10a

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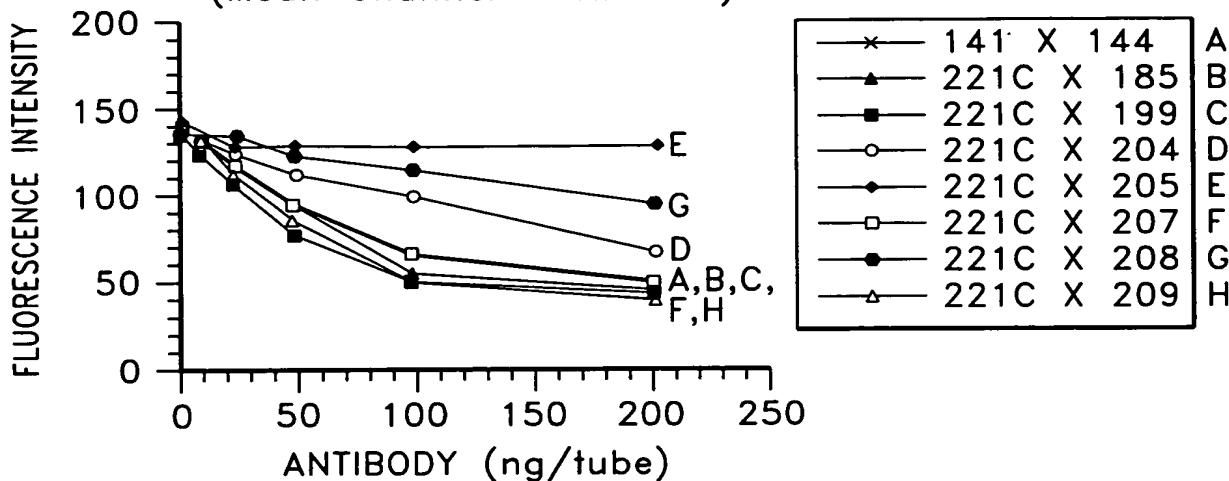
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**OKT3 - GRAFTED HEAVY CHAINS
BINDING ASSAY
(Mean Channel - HPALL's)**



● (205)	-, --, 24, 48, 49, 71, 73, 76, 78, 88, 91,
● (208)	6, --, 24, 48, 49, 71, 73, --, 78, --, --,
○ (204)	6, --, 24, 48, 49, 71, 73, 76, 78, --, --,
■ (199)	6, 23, 24, 48, 49,
□ (207)	6, 23, 24, 48, 49, 71, 73, --, 78, --, --,
▲ (185)	6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
△ (209)	6, 23, 24, 48, 49, --, --, --, 78, --, --,
× 141 X 144	

FIG. 10b

Application No.: 08/846.658

Application No.: 03/346,958

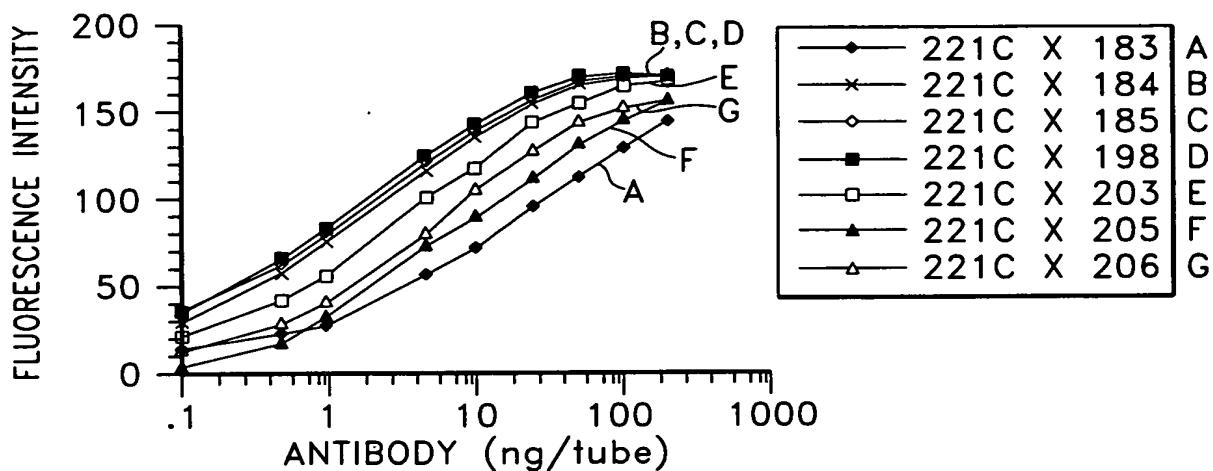
Inventors: John B. Adair, Diljeet S. Athwal and John S. Emptage

Inventors: JOHN R. ADAM
Docket No. CARP-0057

Date of Filing: May 1, 1997

Date of Filing: May 1, 1997
Telephone No. (215) 568-3100

OKT3 - GRAFTED HEAVY CHAINS
BINDING ASSAY
(Mean Channel - HPALL's)



—◆— (183) —, —, —, —, 48, 49, 71, 73, 76, 78, 88, 91,
 —▲— (205) —, —, 24, 48, 49, 71, 73, 76, 78, 88, 91,
 —*— (184) 6, 23, 24,
 —△— (206) —, —, 24, 48, 49, 71, 73, 76, 78, —, —, —,
 —□— (203) 6, —, 24, 48, 49, 71, 73, 76, 78, 88, 91,
 —◊— (185) 6, 23, 24, 48, 49, 71, 73, 76, 78, 88, 91,
 —■— (198) 6, 23, 24, 48, 49, 71, 73, 76, 78, —, —, —

FIG. 11a

Application No.: 08/846,658

Title: Humanised Antibodies

Inventors: John R. Adair, Diljeet S. Athwal and John S. Emtage

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Date of Filing: May 1, 1997

Atty: Doreen Yatko Trujillo

Telephone No. (215) 568-3100

OKT3 - GRAFTED HEAVY CHAINS
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(Mean Channel - HPALL's)

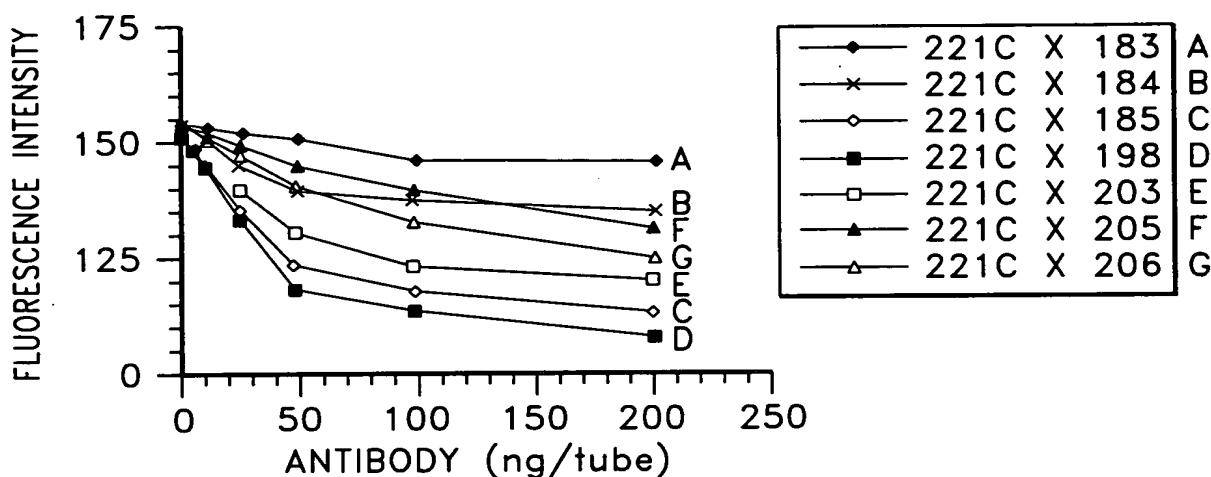


FIG. 11b

Application No.: 08/846,658

Title: Humanised Antibodies

Inventors: John R. Adair, Diljeet S. Athwal and John S. Emtage

Docket No. CARP-0057

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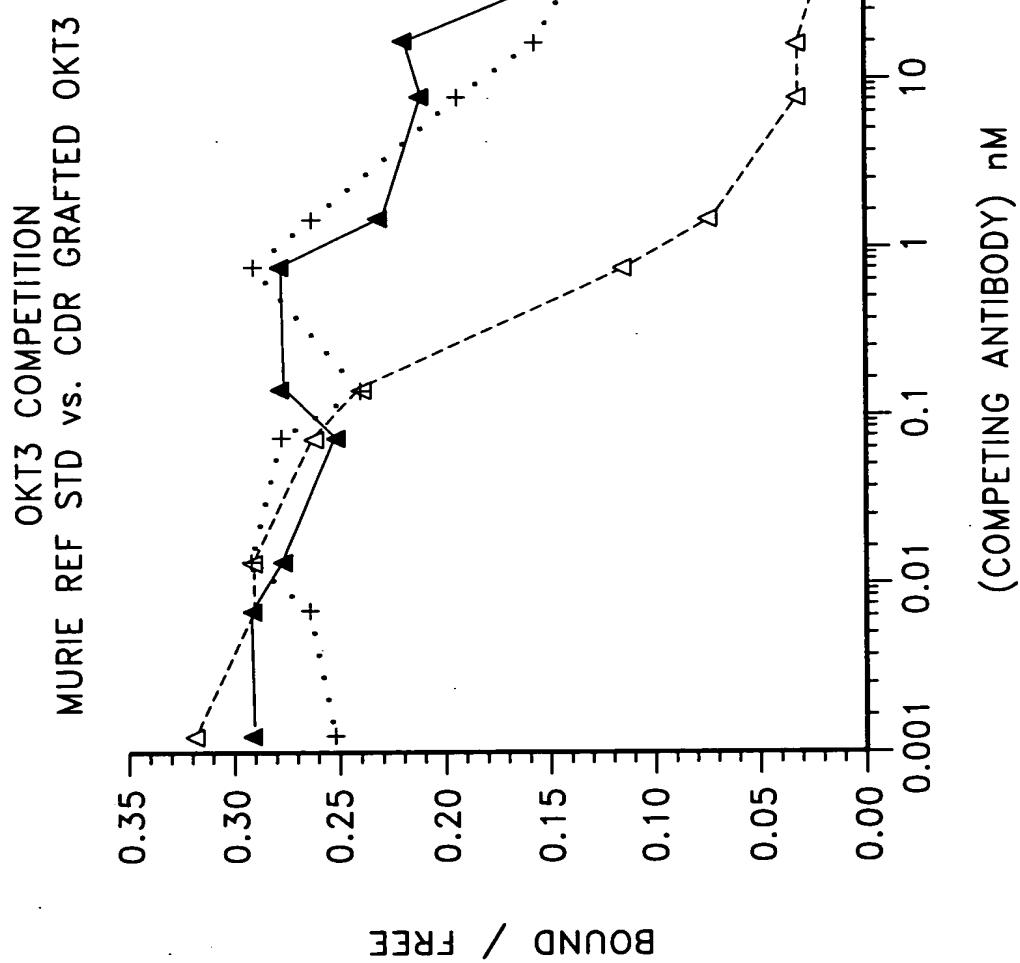


FIG. 12

Application No.: 08/846,658

Title: Humanised Antibodies

Inventors: John R. Adair, Diljeet S. Athwal and John S. Emtage

Docket No. CARP-0057

Date of Filing: May 1, 1997

Atty: Doreen Yatko Trujillo

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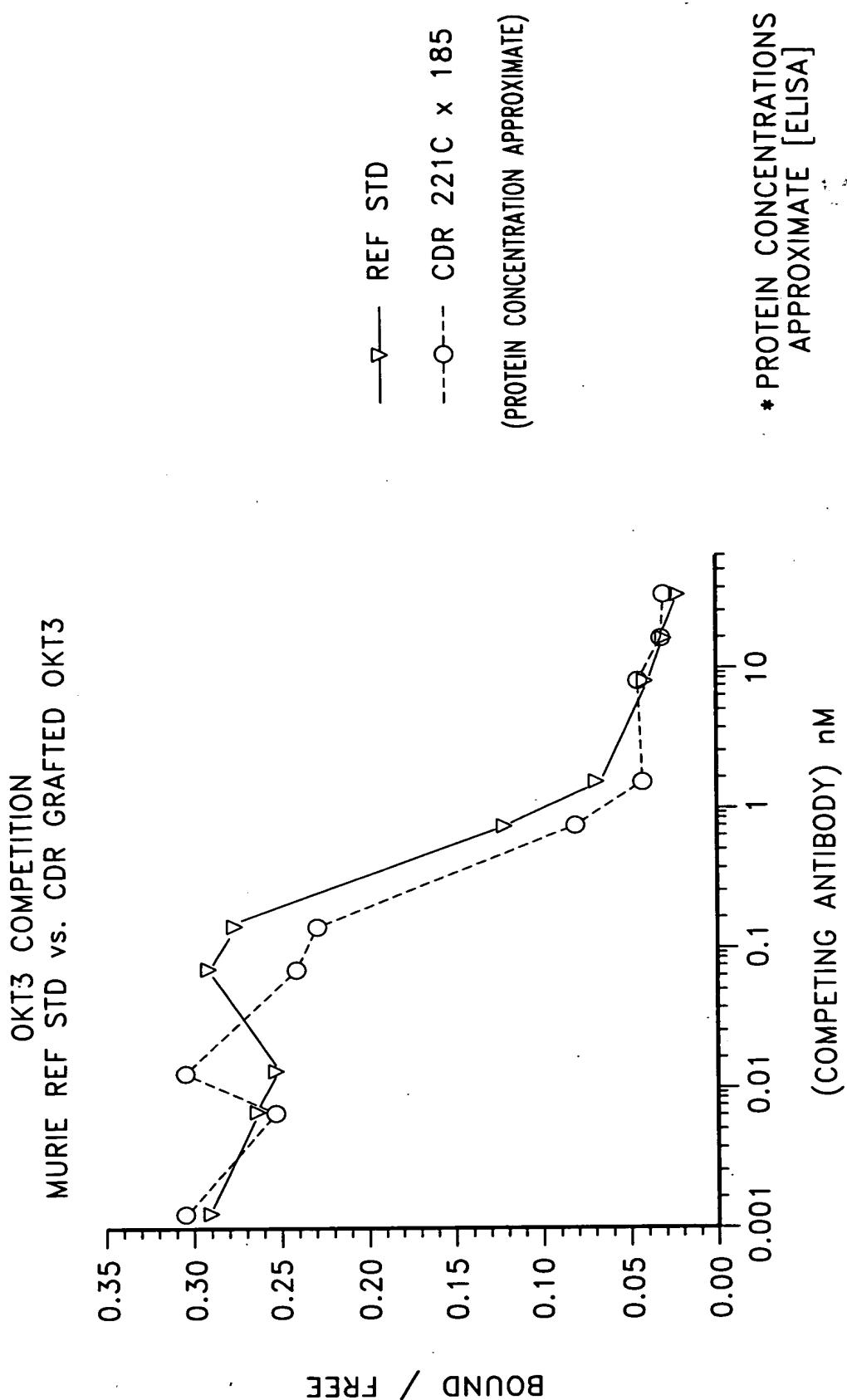


FIG. 13